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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/595,031	12/30/2005	Jens C. Rasmussen	1826.1129	1554
79326	7590	11/23/2009	EXAMINER	
Fujitsu Patent Center			SEDIGHIAN, REZA	
C/O CPA Global			ART UNIT	
P.O. Box 52050			PAPER NUMBER	
Minneapolis, MN 55402			2613	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/595,031

**Applicant(s)**

RASMUSSEN ET AL.

**Examiner**

M. R. Sedighian

**Art Unit**

2613

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 July 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4 and 6-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 10, 11, 13, 15 and 17 is/are rejected.
- 7) ☒ Claim(s) 4, 6-9, 12, 14 and 16 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/30/05 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

1. This communication is responsive to applicant's 7/29/09 amendment and remarks. The amendment has been entered. Claims 1-4 and 6-17 are now pending.
2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 10-11, 13, 15, and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Kikuchi (US Patent No: 6,671,464 B1).

Regarding claims 1, 10, and 11, Kikuchi teaches a polarization mode dispersion compensator (100, fig. 6), comprising: a polarization transformer (PC, fig. 6) to transform polarization of an input optical signal (col. 8, lines 61-67, col. 9, lines 1-5); a compensation unit (136, fig. 6) to compensate for a polarization mode dispersion of the input optical signal and output an output optical signal (col. 8, lines 66-67); a polarimeter (104, fig. 6) to measure a state of polarization (col. 3, line 7, col. 5, lines 1-2, col. 9, lines 55-65) and a degree of polarization (col. 3, lines 7-10, col. 5, line 1-2), and distortion of the output optical signal (col. 5, lines 20-27, col. 6, lines 1-8, col. 9, lines 64-66) and generate a feedback signal (the output signal from polarization state analyzer 104 and 106-1, 106-2, fig. 6) indicating the measured state of polarization (col. 9, lines 55-65) and degree of polarization (col. 9, lines 1-3); and a control circuit (105, fig. 6) to generate based on the feedback signal, control signals (106-1, fig. 6) for adjusting the polarization transformer (PC, fig. 6) so that a plurality of target states of polarization in which the degree of polarization is measured are realized in output optical signals

of following operations (col. 9, lines 1-3, col. 12, lines 64-67, col. 13, lines 1-4) and to search the plurality of target states of polarization for a state of polarization corresponding to a maximum degree of polarization (col. 3, lines 30-32, col. 5, lines 28-32, col. 12, lines 58-61).

Regarding claims 13, 15, and 17, Kikuchi teaches the control signals are adjusted to drive the polarization transformer according to the state of polarization corresponding to a maximum degree of polarization (col. 7, lines 8-12, col. 9, lines 1-3, col. 12, lines 58-61).

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kikuchi (US Patent No: 6,671,464 B1) in view of Rao et al. (US Patent Application Publication No: 2004/0016874 A1).

Regarding claim 2, Kikuchi differs from the claimed invention in that Kikuchi does not disclose the polarization transformer is realized by multiple three-electrode structures on a  $\text{LiNbO}_3$  substrate. Rao discloses a polarization transformer (108, fig. 4) that is formed by multiple three-electrode structures on a  $\text{LiNbO}_3$  substrate (page 2, paragraph 0015, lines 1-7 and page 5, paragraph 0060, lines 1-5). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate a polarization transformer such as the one of Rao for the polarization transformer or the PC of Kikuchi to provide a polarization

transformer that transforms the fluctuating output polarization state of the optical fiber into a stable state of polarization (Rao, page 1, paragraph 0002).

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kikuchi (US Patent No: 6,671,464 B1) in view of Koch et al. (US Patent Application Publication No: 2004/0207902 A1).

Regarding claim 3, Kikuchi further teaches the compensation optical unit can include a polarization maintaining fiber (col. 13, lines 15-17). Kikuchi differs from the claimed invention in that Kikuchi does not disclose the compensation optical unit further includes a birefringent crystal to introduce an amount of different group delay. Koch teaches the use of a birefringent crystal to introduce group delay (page 7, paragraph 0074, lines 1-9). As it is taught by Koch, it would have been obvious to a person of ordinary skill in the art to incorporate a birefringent crystal in the polarization compensation unit of Kikuchi to vary the compensation quantity of polarization mode dispersion.

7. Claims 4, 6-9, 12, 14, and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. Applicant's arguments filed 7/29/09 have been fully considered but they are not persuasive.

As to claim 1, remark states Kikuchi fails to describe “a polarimeter to measure a state of polarization and a degree of polarization of the output optical signal and generate a feedback signal indicating the measured state of polarization and degree of polarization”. However, Kikuchi does teach such limitations. Kikuchi teaches a polarimeter (see col. 3, lines 5-7, col. 5, line 1 and 104, figs. 6, 8, the use of a polarization state analyzer) can be used to measure a state of polarization (col. 3, line 7, col. 5, lines 1-2, col. 9, line 55-60, detecting polarization state of the optical signal) and a degree of polarization (col. 3, lines 7-10, col. 5, line 1-2, col. 9, lines 55-56) of the output optical signal (see fig. 6) and generate (104, fig. 6) a feedback signal (the output signal from polarization state analyzer 104 and 106-1, 106-2, fig. 6) indicating the measured state of polarization (col. 9, lines 55-61) and degree of polarization (col. 9, lines 1-3, 61-65). As to claims 10 and 11, remark further states Kikuchi fails to disclose “a distortion analyzer to measure a state of polarization and a distortion of the output optical signal and generate a feedback signal indicating the measured state of polarization and distortion”. Kikuchi also teaches such limitations. Kikuchi teaches a distortion analyzer (104, figs. 6, 8) that measures a state of polarization (col. 5, lines 1-2, col. 9, line 55-60, detecting the polarization state of the optical signal) and a distortion of the output optical signal (col. 5, lines 20-27, col. 6, lines 1-7, compensating waveform distortion of the optical signal) and generate (104, figs. 6, 8) a feedback signal (the output signal from polarization state analyzer 104, figs. 6, 8) indicating the measured state of polarization (col. 9, lines 56-61) and distortion (col. 5, lines 20-27, col. 9, lines 64-66).

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. R. Sedighian whose telephone number is (571) 272-3034. The examiner can normally be reached on 9 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR

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system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. R. Sedighian/

Primary Examiner, Art Unit 2613